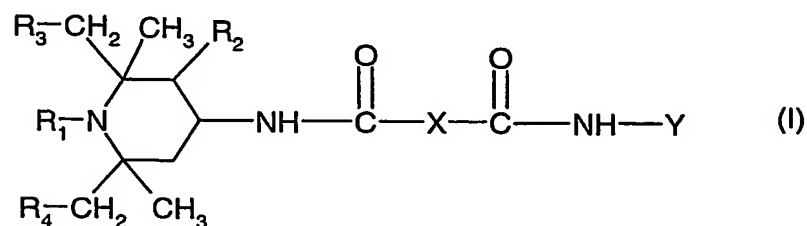


Claims:

1. A light stabilized composition containing

(1) a crystalline polypropylene resin and

(2) one or more β -nucleating, light stabilizing agents of the formula (I),



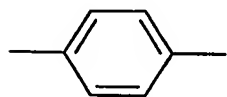
wherein

R₁ is hydrogen, C₁-C₈alkyl, -O⁻, -OH, -CH₂CN, C₁-C₁₈alkoxy, C₂-C₁₈alkoxy substituted by -OH; C₅-C₁₂cycloalkoxy, C₃-C₆alkenyl, C₇-C₉phenylalkyl unsubstituted or substituted on the phenyl by 1, 2 or 3 C₁-C₄alkyl; or C₁-C₈acyl;

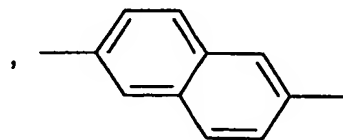
R₂ is hydrogen or methyl;

R₃ and R₄ are hydrogen or methyl;

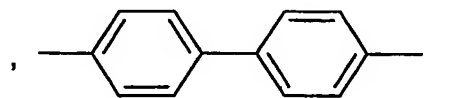
X is C₂-C₁₀alkylene or a group of the formula (II-a-1), (II-a-2), (II-a-3), (II-b-1), (II-b-2) or (II-b-3); and



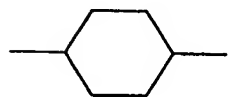
(II-a-1)



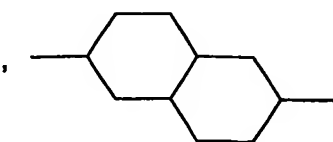
(II-a-2)



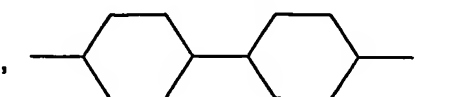
(II-a-3)



(II-b-1)

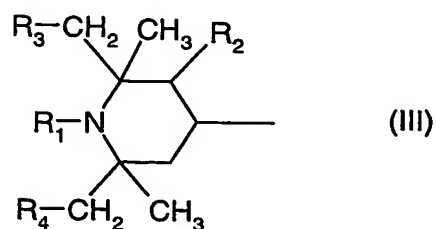


(II-b-2)



(II-b-3)

Y is C₅-C₁₂cycloalkyl, C₅-C₁₂cycloalkyl substituted by 1, 2 or 3 C₁-C₄alkyl; or a group of the formula (III)



wherein R_1 , R_2 , R_3 and R_4 are as defined above,

characterized in that the polypropylene resin of component (1) has a content of β -form crystals of at least 5 % calculated by means of the following equation

$$\beta\text{-form crystal content (\%)} = 100 \times P_{\beta 1} / (P_{\alpha 1} + P_{\alpha 2} + P_{\alpha 3} + P_{\beta 1})$$

where $P_{\alpha 1}$ to $P_{\alpha 3}$ are respective peak heights (maxima) of the α -form and $P_{\beta 1}$ is a peak height (maximum) of the β -form determined by wide angle X-ray scattering.

2. A light stabilized composition according to claim 1 wherein R_1 is hydrogen, C_1 - C_4 alkyl, C_1 - C_{10} alkoxy, cyclohexyloxy, allyl, benzyl or acetyl.
3. A light stabilized composition according to claim 1 wherein R_1 is hydrogen or methyl.
4. A light stabilized composition according to claim 1 wherein R_2 , R_3 and R_4 are hydrogen.
5. A light stabilized composition according to claim 1 wherein Y is cyclohexyl or a group of the formula (III).
6. A light stabilized composition according to claim 1 wherein R_1 is hydrogen or methyl, R_2 , R_3 and R_4 are hydrogen, and Y is a group of the formula (III).
7. A light stabilized composition according to claim 1 wherein X is a group of the formula (II-a-1) or (II-a-2).

8. A light stabilized composition according to claim 1, wherein the β -form crystals of component (1) are solidified and / or annealed at ambient temperature or at temperatures (T_s)

$$T_s \leq T_{cr} + 35^\circ\text{C}$$

T_{cr} being the recrystallization temperature of the polypropylene resin (component (1)) without a β -nucleating, light stabilizing agent, as determined by differential scanning calorimetry (DSC) by cooling the molten polypropylene resin at a cooling rate of 10 K/min.

9. A light stabilized composition according to claim 1 wherein the polypropylene resin of component (1) has a content of β -form crystals of 10 to 98 %.

10. A light stabilized composition according to claim 1 wherein the polypropylene resin of component (1) has a content of β -form crystals of 15 to 80 %.

11. A light stabilized composition according to claim 1, which is further characterized in that the polypropylene resin has a haze which is greater than 62 %; the haze value being measured at a plate of 1.1 – 1.2 mm thickness.

12. A light stabilized composition according to claim 1 wherein component (1) is a polypropylene homopolymer.

13. A light stabilized composition according to claim 1 wherein component (1) is a polypropylene random copolymer, alternating or segmented copolymer or block copolymer containing one or more comonomers selected from the group consisting of ethylene, C_4 - $C_{20}\alpha$ -olefin, vinylcyclohexane, vinylcyclohexene, C_4 - C_{20} alkanediene, C_5 - C_{12} cycloalkandiene and norbornene derivatives.

14. A light stabilized composition according to claim 1 wherein component (1) is a thermoplastic polyolefin (TPO).

15. A light stabilized composition according to claim 1 which additionally contains (3) a further polymer,

with the proviso that component (3) is different from component (1).

16. A method for improving the light stability of a polypropylene resin and for providing said polypropylene resin with a content of β -form crystals of at least 5 % calculated by means of the following equation

$$\beta\text{-form crystal content (\%)} = 100 \times P_{\beta 1} / (P_{\alpha 1} + P_{\alpha 2} + P_{\alpha 3} + P_{\beta 1})$$

where $P_{\alpha 1}$ to $P_{\alpha 3}$ are respective peak heights of the α -form (maxima) and $P_{\beta 1}$ is a peak height (maximum) of the β -form determined by wide angle X-ray scattering, **which comprises** incorporating into the polypropylene resin one or more β -nucleating, light stabilizing agents as defined in claim 1.

17. A use of the compound of the formula (I) as defined in claim 1, as β -nucleating, light stabilizing agent for a polypropylene resin.

18. A shaped article containing a composition according to claim 1.

19. A shaped article according to claim 18, which is a molded article.

20. A shaped article according to claim 19, where the molding is effected by injection, blow, compression, roto-molding or slush-molding or extrusion.

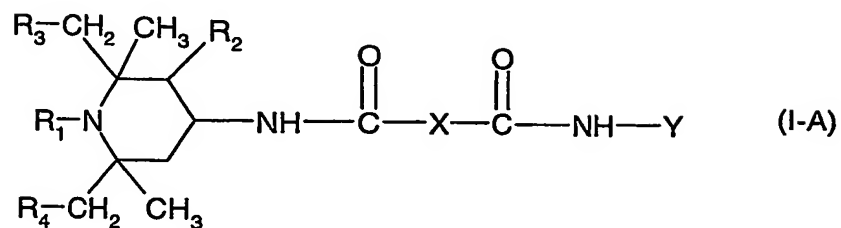
21. A shaped article according to claim 18, which is a film, fiber, profile, pipe, bottle, tank or container.

22. A monoaxially-oriented film or a biaxially-oriented film which has been formed by stretching a film according to claim 21.

23. A fiber which has been formed by stretching a fiber according to claim 21.

24. A multilayer system in which one or more layers contain a composition according to claim 1.

25. A compound of the formula (I-A)



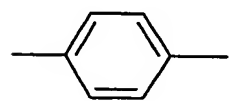
wherein

R₁ is hydrogen, C₁-C₈alkyl, -O-, -OH, -CH₂CN, C₁-C₁₈alkoxy, C₂-C₁₈alkoxy substituted by -OH; C₅-C₁₂cycloalkoxy, C₃-C₆alkenyl, C₇-C₉phenylalkyl unsubstituted or substituted on the phenyl by 1, 2 or 3 C₁-C₄alkyl; or C₁-C₈acyl;

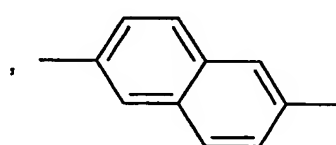
R₂ is hydrogen or methyl;

R₃ and R₄ are hydrogen or methyl;

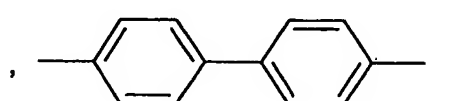
X is C₂-C₁₀alkylene or a group of the formula (II-a-1), (II-a-2), (II-a-3), (II-b-1), (II-b-2) or (II-b-3); and



(II-a-1)



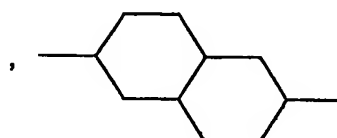
(II-a-2)



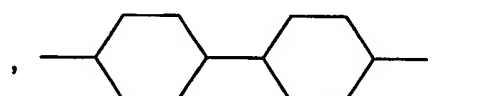
(II-a-3)



(II-b-1)

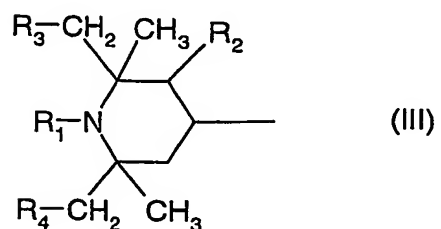


(II-b-2)



(II-b-3)

Y is C₅-C₁₂cycloalkyl, C₅-C₁₂cycloalkyl substituted by 1, 2 or 3 C₁-C₄alkyl; or a group of the formula (III)

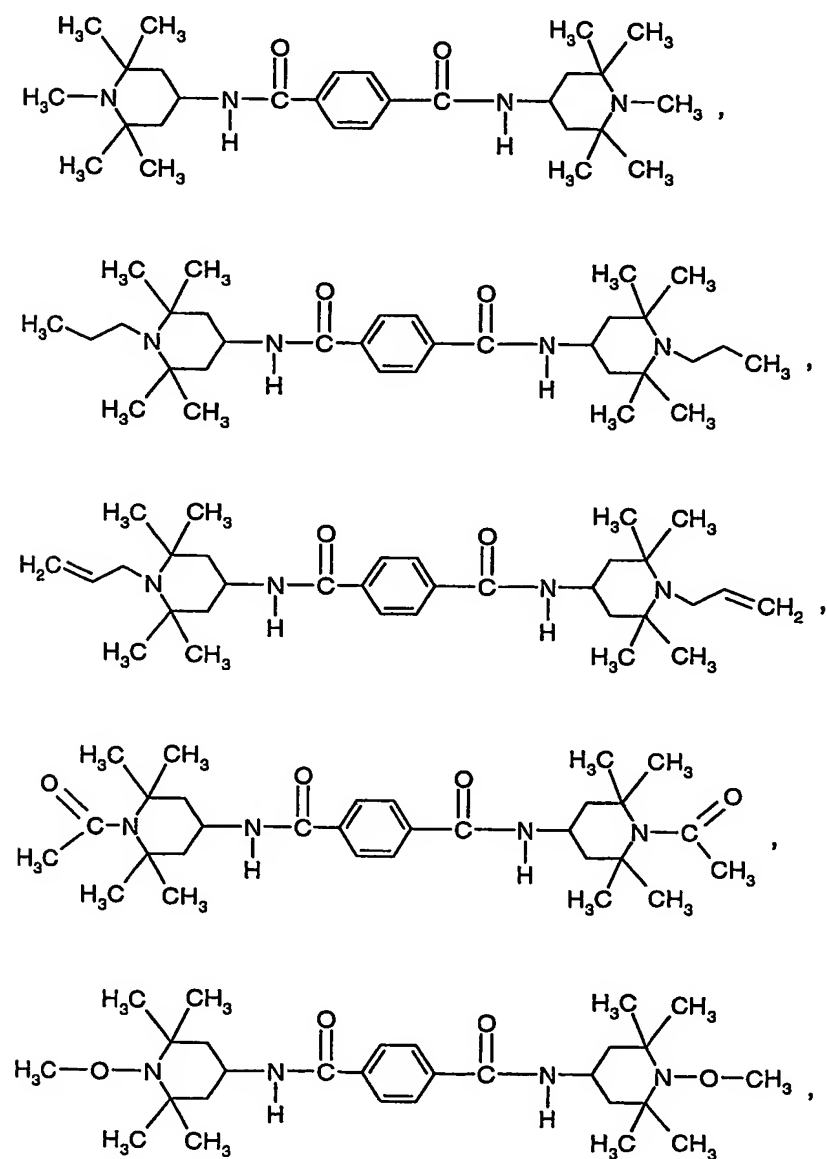


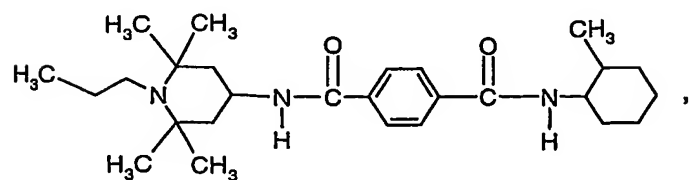
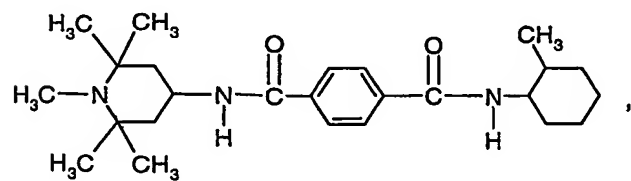
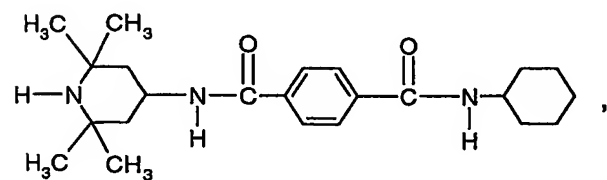
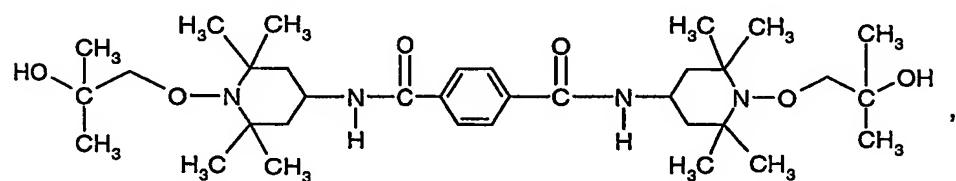
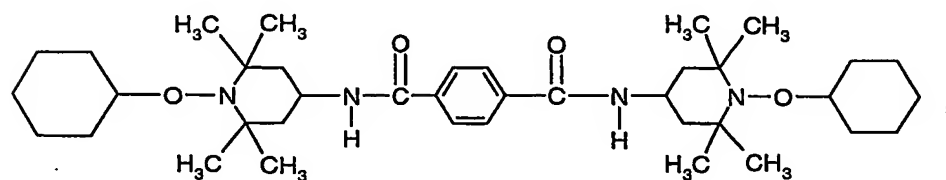
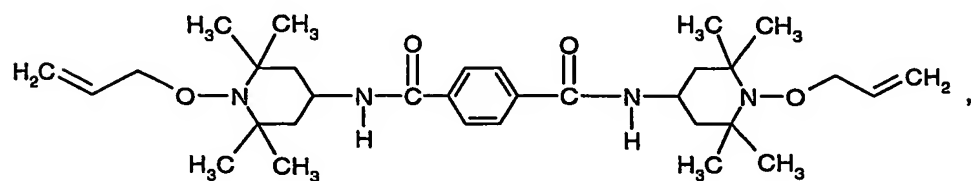
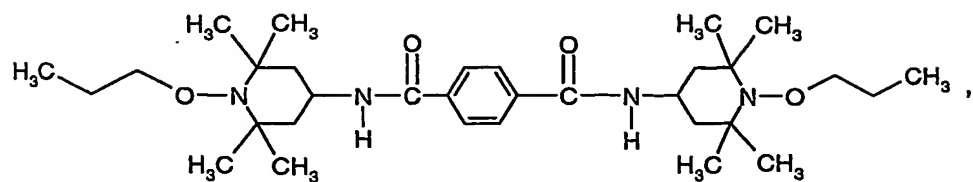
wherein R_1 , R_2 , R_3 and R_4 are as defined above;

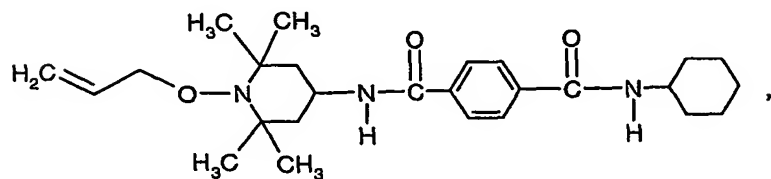
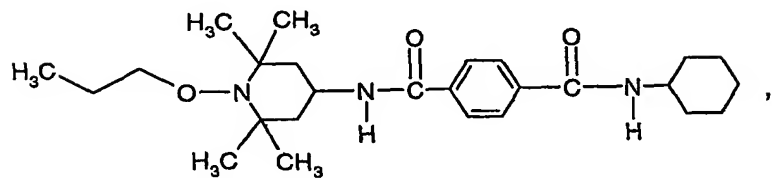
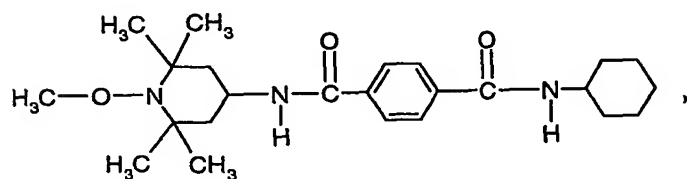
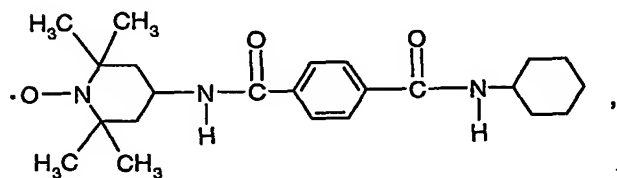
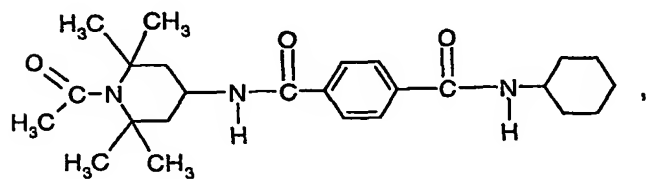
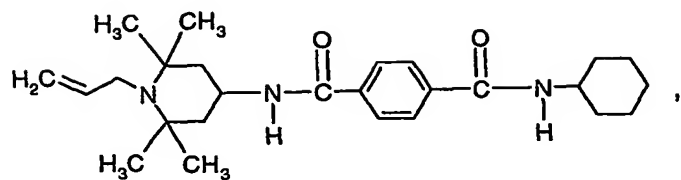
with the proviso that

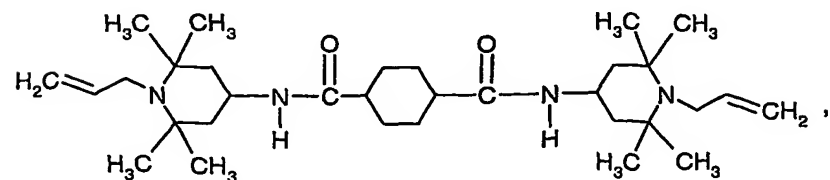
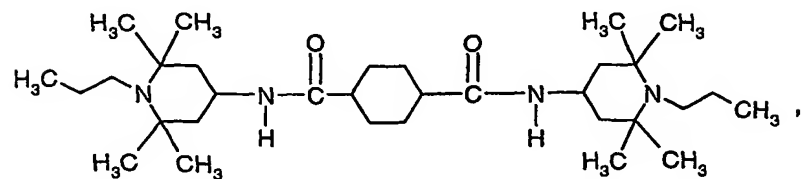
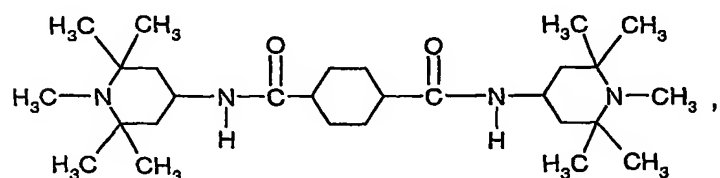
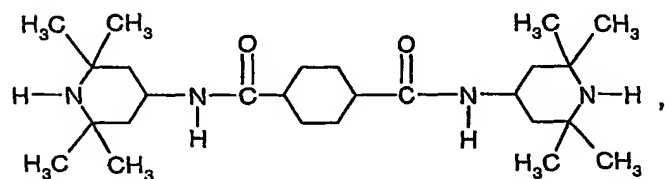
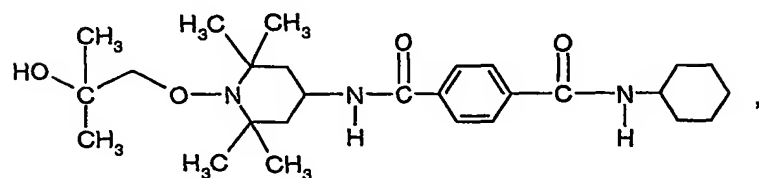
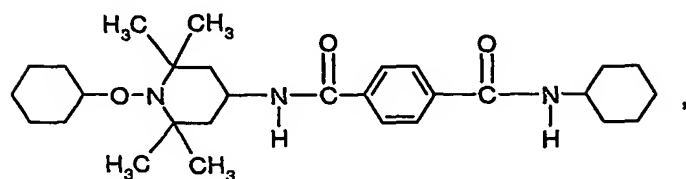
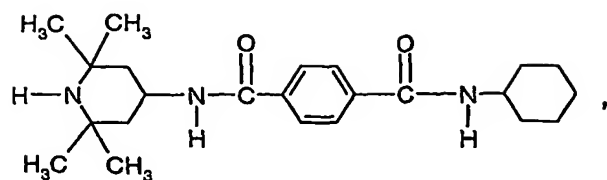
R_1 is different from hydrogen and $-O\cdot$, when Y is a group of the formula (III) and at the same time X is the group (II-a-1).

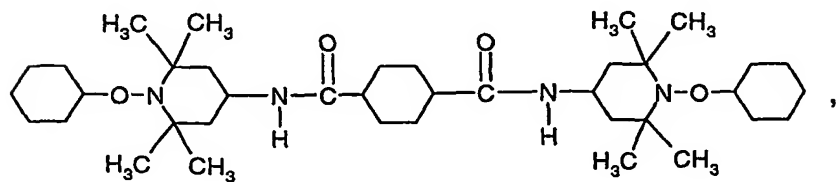
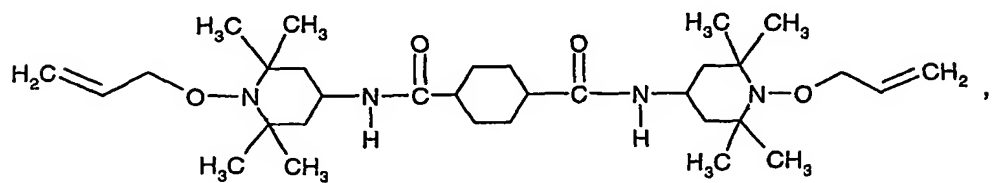
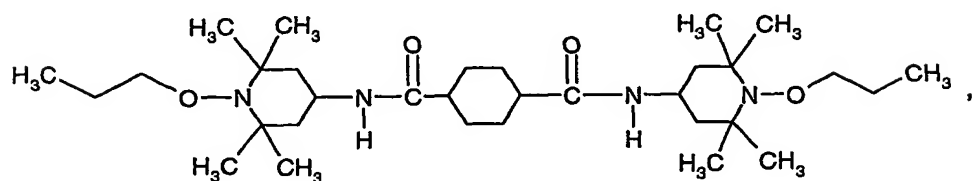
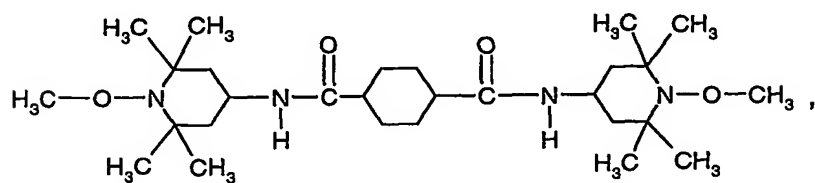
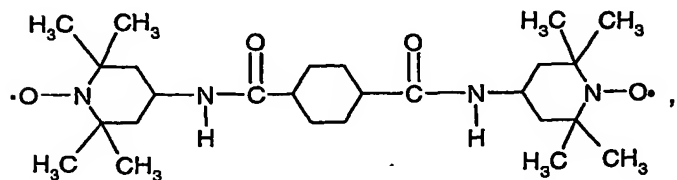
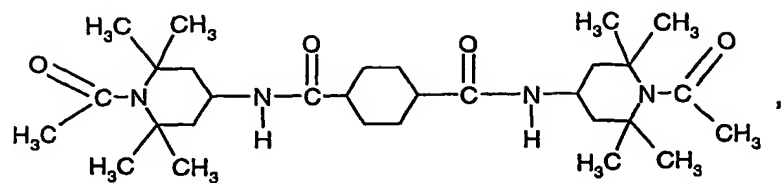
26. A compound according to claim 25 which corresponds to

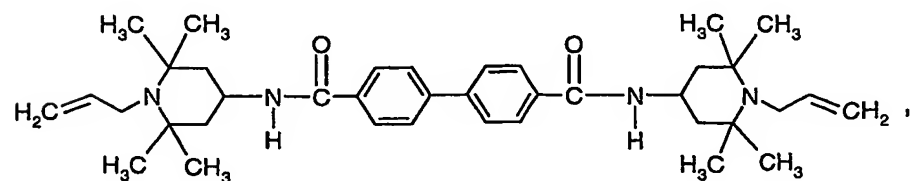
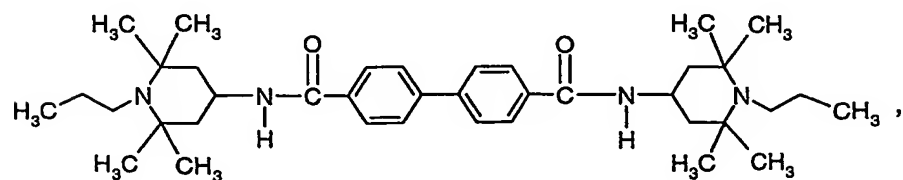
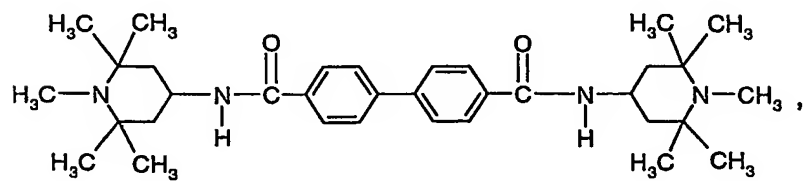
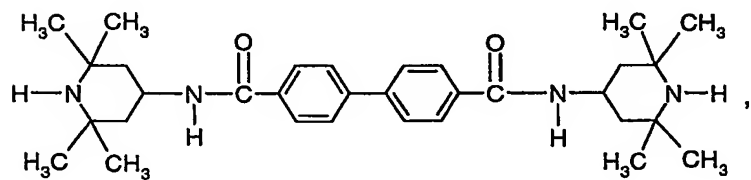
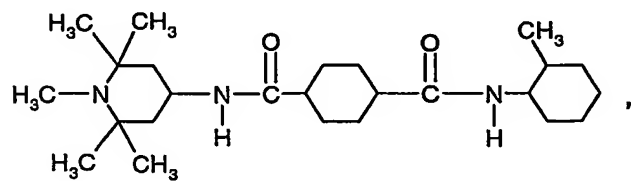
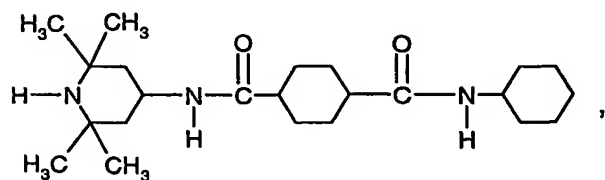
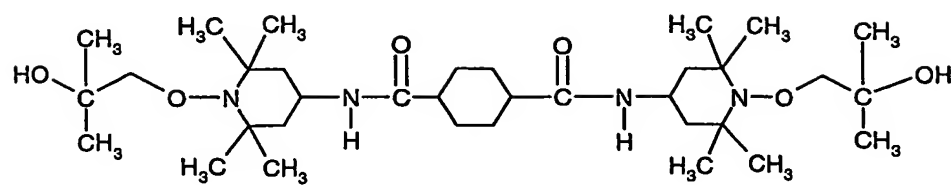


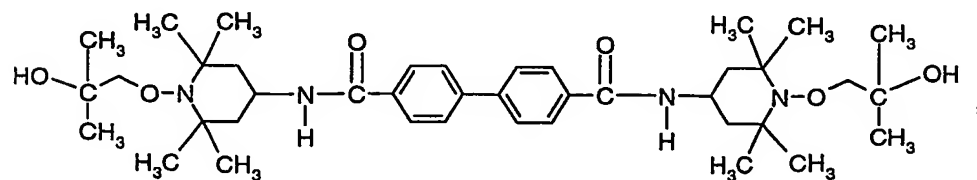
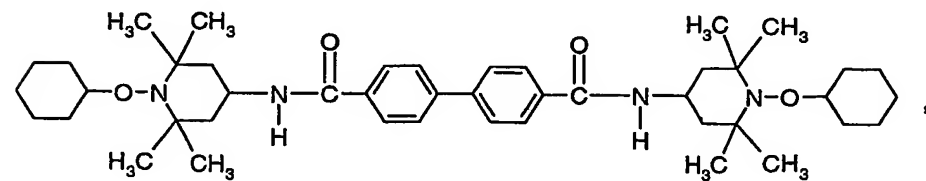
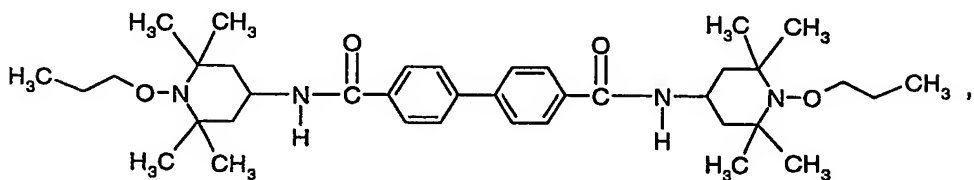
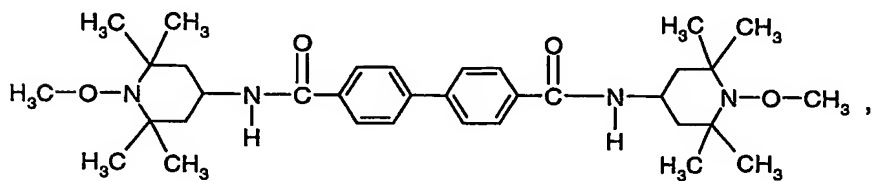
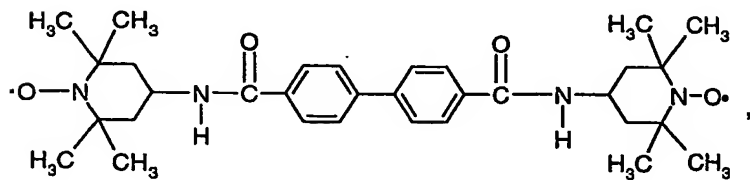
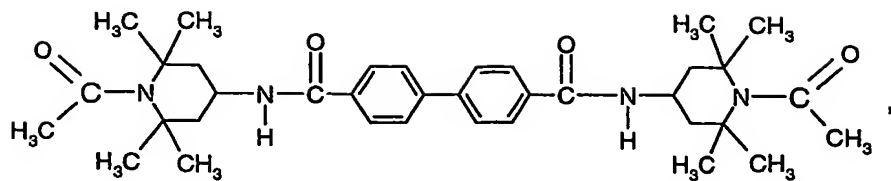


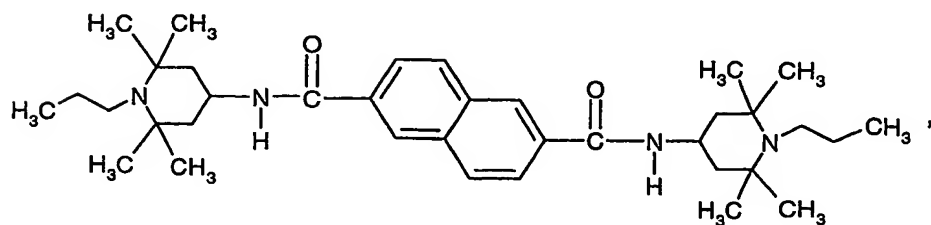
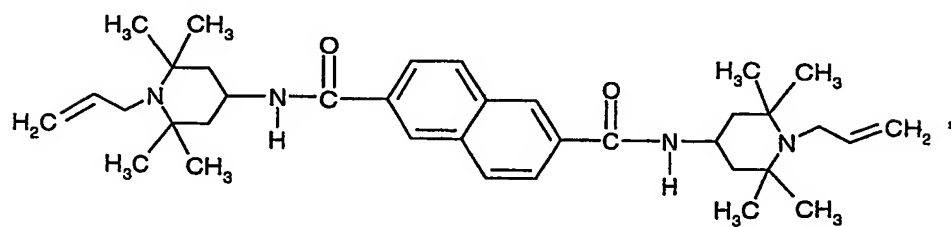
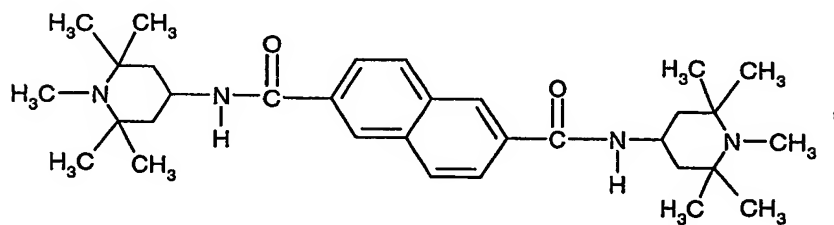
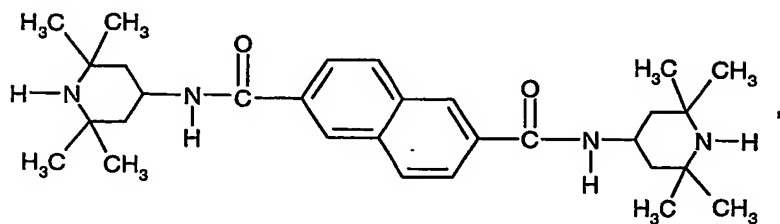
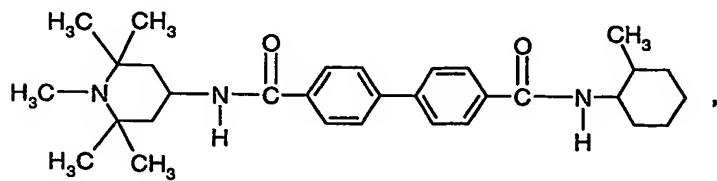
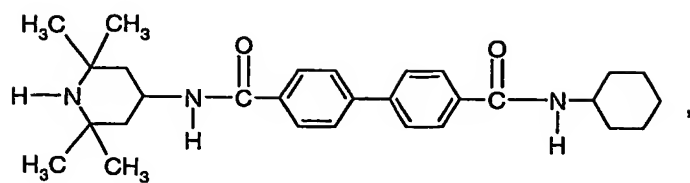


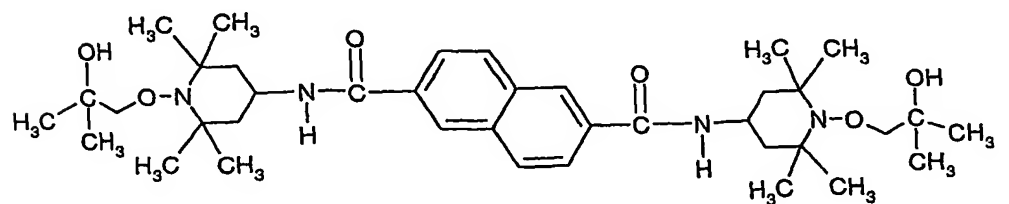
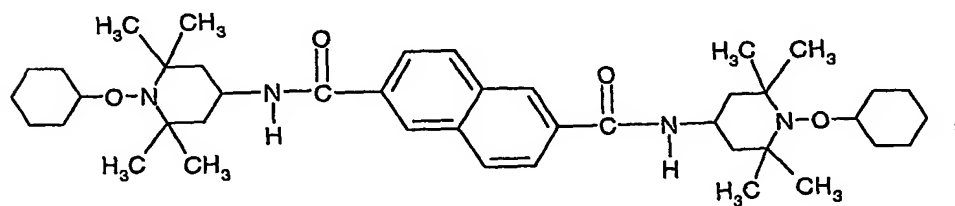
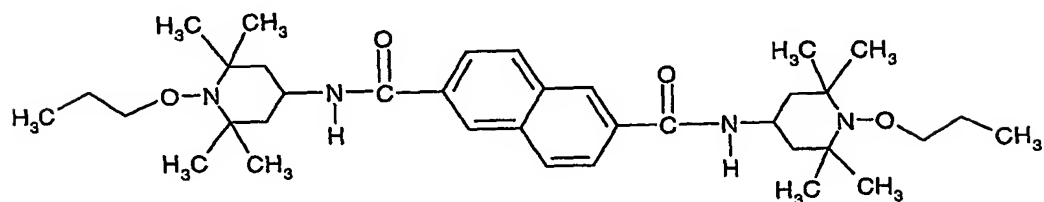
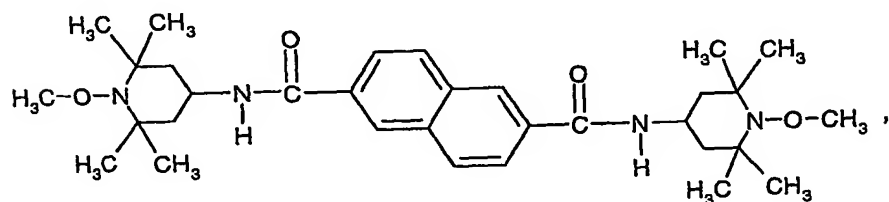
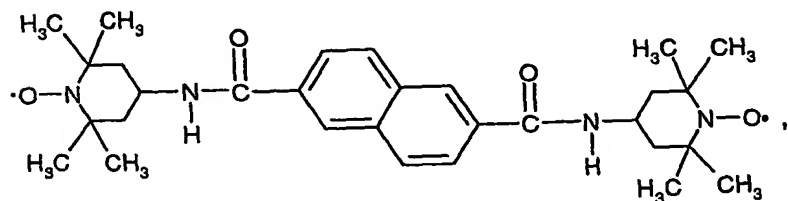
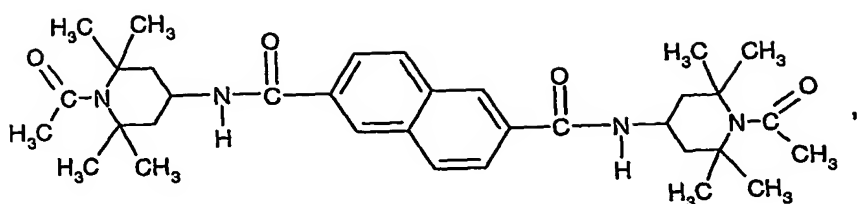


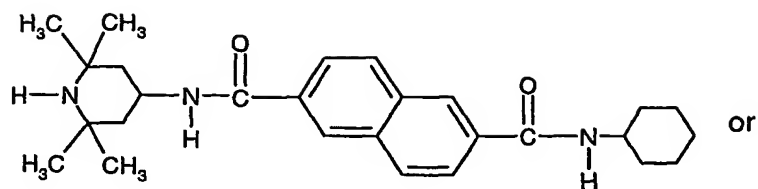




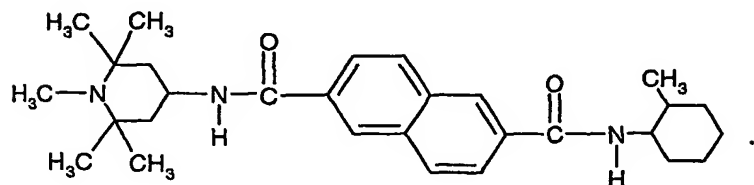








or



27. A composition containing a polymer susceptible to degradation induced by light, heat or oxidation, and a compound according to claim 25.

28. A method for stabilizing a polymer against degradation induced by light, heat or oxidation, which comprises incorporating into the polymer a compound according to claim 25.